Measure 3: Transit Ridership and Bus Volumes

Monitoring Objectives

The purpose of monitoring transit passenger and bus volumes is as follows:

- Provide data on bus volumes by street segment in downtown Seattle.
- Measure the average weekday PM peak hour and weekday passenger loads crossing the Seattle CBD north-south screen line.
- Provide data as available from Community Transit and Pierce Transit on average ridership crossing the north-south screen line during average PM peak hours and weekdays.
- Identify and analyze any substantive changes in ridership or bus volumes for before and after tunnel closure conditions.

Methodology

Bus volumes used for this analysis were extracted from HASTUS - the King County Metro scheduling system - using the February 2005 and September 2005 service changes. These counts include in service as well as out-of-service coaches. A projection of bus volumes on downtown streets for after tunnel closure was issued with Volume 1, the Baseline Report. These projected bus volumes will be compared with actual bus volumes from the September 2005 service change, inclusive of routing adjustments made mid-shakeup to alleviate problems on Stewart Street.

For passenger loads, the Automated Passenger Count (APC) system is the primary source for passenger data for Metro coaches. APC data is collected in a random sample during each signup, downloaded and processed monthly. This data is summarized in a final form at the end of each signup. Preliminary data, based on smaller samples, is available monthly. Metro driver count data is collected on an ad hoc basis when preliminary APC results indicate that observations of trips on a particular route will fall below an adequate sample. Ridership data on Community Transit and Pierce Transit service is generated by the monitor reports supplied by each of these agencies. The ridership data from Community Transit and Pierce Transit is available by signup at the aggregate level.

APC data, supplemented by driver counts and estimates for any non-APC observed trips, was used to estimate Metro ridership volumes crossing the screen line just south of University Street, by trip, for the spring 2004 and fall 2005 signups during the PM peak hour and the average weekday. The results have been summarized by street and by direction to compare ridership volumes and loads before and after tunnel closure.

Bus Volumes

The bus volumes that were projected for downtown street segments during tunnel closure, as shown in the Volume 1 Baseline report, are summarized in Figure 8A. The actual post tunnel bus volumes for downtown streets, including the routing changes that were made on Second Avenue and the mid-shakeup adjustments on Stewart Street are shown in Figure 8B.

Bus volumes in the CBD during the PM Peak are essentially the same for most links as projected. The PM Peak period used for determining transit volumes is 4:30-5:30 p.m. Slight variations in volumes are due to schedule adjustments that change a trip from being within or included or excluded from the measured peak hour. Substantive changes that resulted in changes in bus volumes were a relocation of approximately four trips from Second Avenue to Third Avenue, and the service adjustments on Stewart Street.

Figure 8A. PM Peak Hour Transit Volumes- Projected in September 2005 Baseline Report

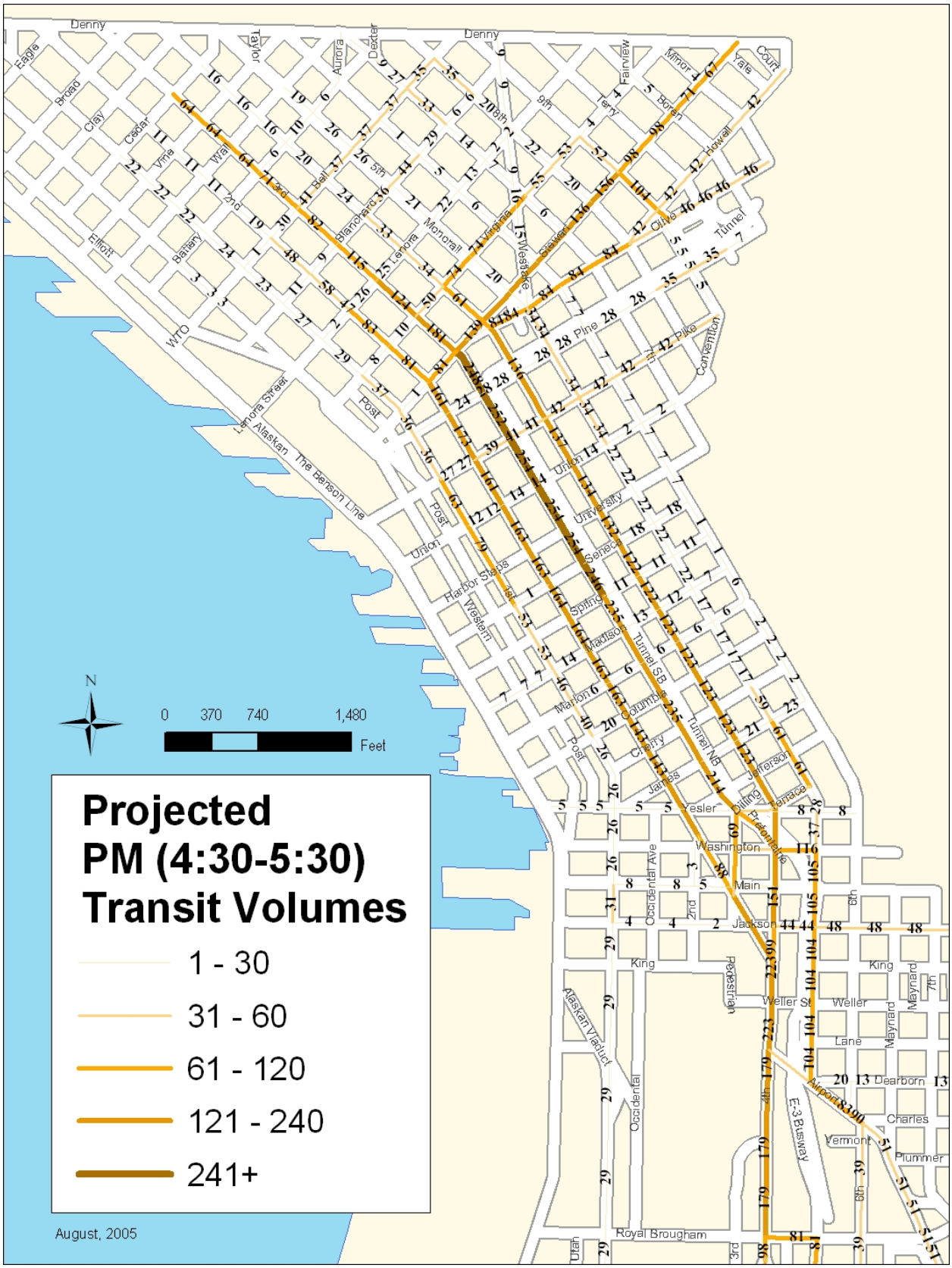
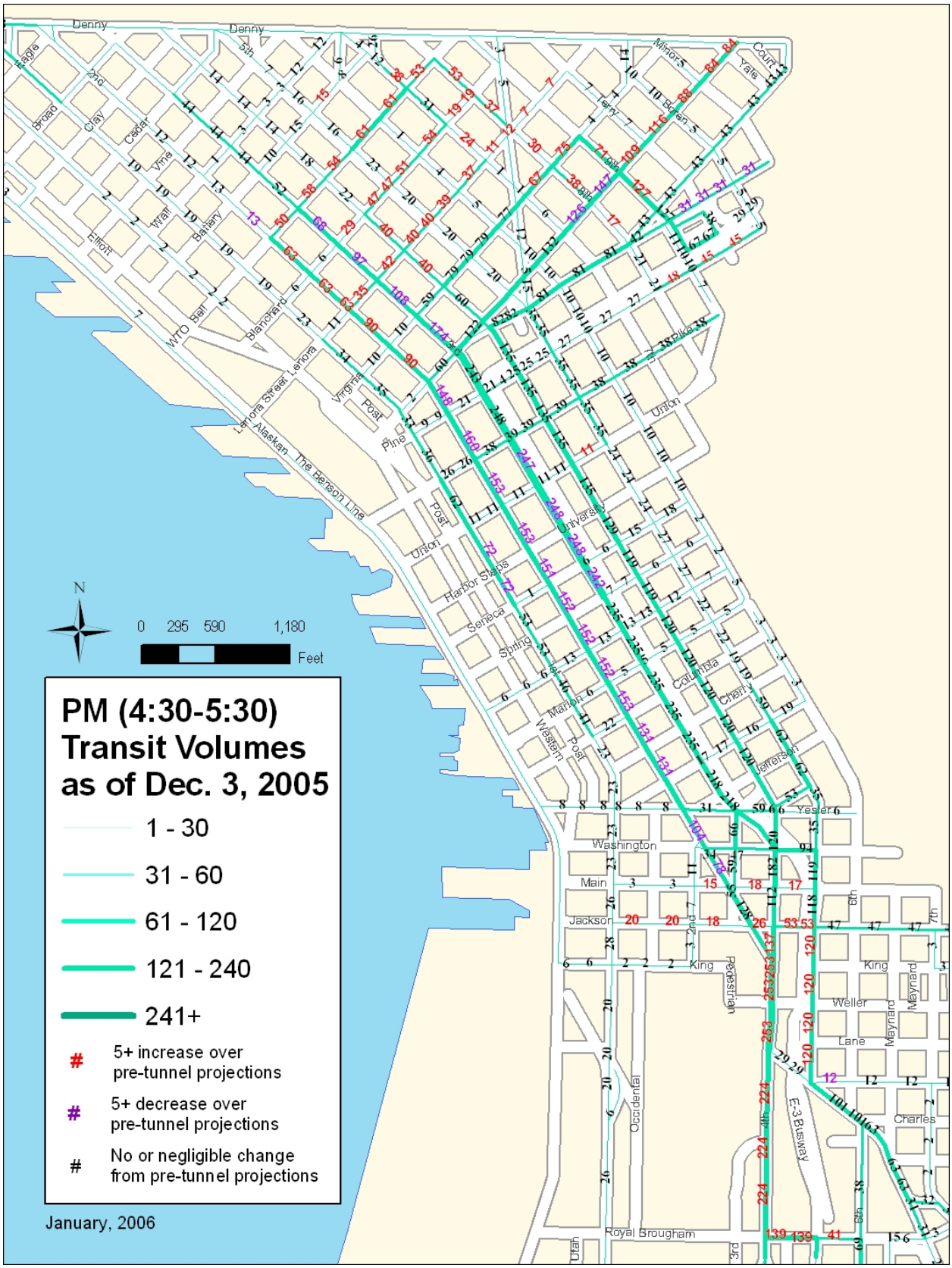


Figure 8B. PM Peak Hour Transit Volumes as of 12/03/05 (includes Stewart Adjustments)



Transit Ridership Volumes

Prior to tunnel closure, approximately 95,000 north-south riders crossed the downtown screen line on King County Metro-operated service at University Street on weekdays in fall 2004. As part of a general increase in ridership throughout the system, this number had increased to almost 106,700 weekday riders by the spring 2005. In fall 2005, ridership figures through November indicated that downtown loads crossing University Street had risen slightly higher, to 107,500. The final average for the entire fall 2005 signup is expected to be slightly lower, because ridership in December and January is typically lower than the counts for October and November. In addition, overall ridership on Community Transit-operated commuter services from downtown Seattle to Snohomish County increased by about 8.5 percent between May and October 2005. Ridership on Sound Transit commuter services from Pierce County as operated by Pierce Transit decreased by 4.9 percent but for the same period ridership on Sounder grew by 38.1 percent, for a net increase.

Given the general upward ridership trend, this report uses spring 2005 data for the before tunnel closure condition rather than fall 2004 to reflect the ridership growth that occurred prior to tunnel closure. Because Community Transit and Pierce Transit do not keep segment-level load statistics, the following discussion uses King County Metro data only.

Figure 9 compares the preliminary fall ridership at University Street on King County Metro-operated service with the baseline spring 2005 loads. Average weekday loads increased by slightly less than 1 percent. However, the total load crossing the screen line during the peak hour from 4:30-5:30 p.m. actually declined slightly.

Figure 9. Passenger Loads at University Street, before and after Tunnel Closure

		Weekday Riders		Percent Change	1-Hr PM Peak Riders		Percent Change
Avenue	Dir	Spring 2005	Fall 2005		Spring 2005	Fall 2005	
First	N	9,861	10,208	+3.5%	757	685	-9.5%
	S	6,002	6,484	+8.0%	469	597	+11.1%
Second	S	16,423	14,793	+8.3%	2,465	2,337	+9.4%
Third	N	17,849	28,380	+59.0%	1,478	2,741	+85.5%
	S	17,239	26,485	+53.6%	1,883	3,174	+68.6%
Fourth	N	10,375	15,368	+48.1%	825	1,023	+24.0%
Fifth	S	3,046	4,584	+50.5%	155	249	+60.6%
Tunnel	N	12,991	N.A.		1,188	N.A.	
	S	14,495	N.A.		1,959	N.A.	
Total		106,651	107,534	+0.8%	11,179	11,092	-0.8%

Figure 10 uses preliminary fall 2005 data to compare standing loads at University Street with the baseline spring 2005 standing loads. While the incidence of standing loads has increased, as expected, it is still well below the level of concern, especially given the preliminary nature of this data.

Figure 10. Loads over Seating Capacity at University Street, before and after Tunnel Closure

		Average Loads Greater than Seat Capacity				Average Loads 20% over Seating Capacity			
		Percent of Weekday Trips		Percent of Peak 1-Hr Trips		Percent of Weekday Trips		Percent of Peak 1-Hr Trips	
Avenue	Dir	Spring 05	Fall 05	Spring 05	Fall 05	Spring 05	Fall 05	Spring 05	Fall 05
First	N	1.8%	2.7%	7.5%	5.9%	0.0%	0.9%	0.0%	2.9%
	S	1.3%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Second	S	0.3%	0.5%	0.0%	0.9%	0.0%	0.4%	0.0%	0.9%
Third	N	1.2%	2.2%	1.5%	0.8%	0.2%	0.6%	0.0%	0.0%
	S	5.0%	5.4%	4.7%	7.7%	1.3%	1.6%	1.6%	1.9%
Fourth	N	0.5%	0.7%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%
Fifth	S	0.8%	0.3%	0.0%	0.0%	0.8%	0.3%	0.0%	0.0%
Tunnel	N	0.4%	N.A.	0.0%	N.A.	0.0%	N.A.	0.0%	N.A.
	S	0.2%	N.A.	0.0%	N.A.	0.0%	N.A.	0.0%	N.A.
Total		1.3%	2.3%	1.4%	2.4%	0.3%	0.7%	0.2%	0.8%

Preliminary fall data indicates that loads leaving the CBD are virtually the same as those leaving the CBD in spring 2005, about 90,800 riders each weekday. However, standing loads have increased, although they still represent a small fraction of all outbound trips. Figure 11 compares the percent of trips with standing loads leaving downtown at various times of the day. The largest increase, not surprisingly, is in the PM peak, when 6.4 percent of trips leaving the Seattle CBD had standing loads, as compared to 3.4 percent of trips in the spring. This increase was spread across a number of routes, including ones that would not be directly affected by tunnel closure.

Figure 11. Percent of Trips Leaving CBD Averaging Standing Loads, before and after Tunnel Closure.

		AM Peak	Midday	PM Peak	Evening	Total
		6-9 a.m.	9 a.m.–3 p.m.	3-7 p.m.	7-11p.m.	
Standing Loads	Spring 2005	2.4%	2.7%	3.4%	0.3%	2.4%
	Fall 2005	3.1%	4.1%	6.4%	0.8%	4.1%
Over 120% Load	Spring 2005	0.0%	0.7%	0.5%	0.0%	0.4%
	Fall 2005	1.1%	1.4%	1.2%	0.3%	1.0%